

FUNDAMENTALS OF TRIAL ADVOCACY COURSE

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Phoenix, Arizona



DUI BLOOD ANALYSIS ISSUES

Presented by:

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Distributed by:

ARIZONA PROSECUTING ATTORNEYS' ADVISORY COUNCIL

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DUI Blood Analysis

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Blood Alcohol Analysis

General Alcohol

Absorption, Elimination, and Distribution
Impairment/Intoxication
Tolerance
Officer Tools – Driving Cues and SFSTs

Blood Alcohol

Blood Draw
Property and Evidence
Notes
Analysis
Quality Assurance

Alcohol

Common Types

NAME	FORMULA	BOILING POINT	USES	TOXICITY AND METABOLITES
Methanol	CH ₃ -OH	64.5°C / 148.1°F	Dishwasher Solvent Paint Remover Fuel	~75ML Formic Acid
Ethanol	C ₂ H ₅ -OH	78.3°C / 172.9°F	Beverage Solvent Medicinal Vehicle Fuel	~400-500ML Acetaldehyde (Acetic Acid)
Isopropylalcohol	C ₃ H ₇ -OH CH ₃	82.3°C / 180.1°F	Disinfectant Antiseptic	~250ML Acetone
Ethylene Glycol	CH ₂ -OH CH ₂ -OH	198°C / 388.4°F	Coolant Solvent	~100ML Oxalic Acid

Absorption

How does it enter the body?

Oral Consumption

Injection

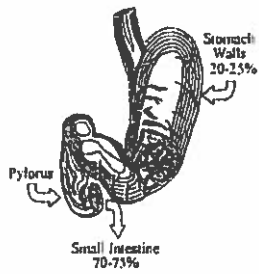
Inhalation

Through the skin

Enema

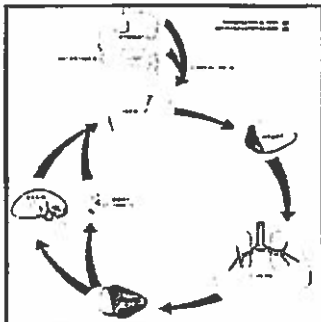
Absorption

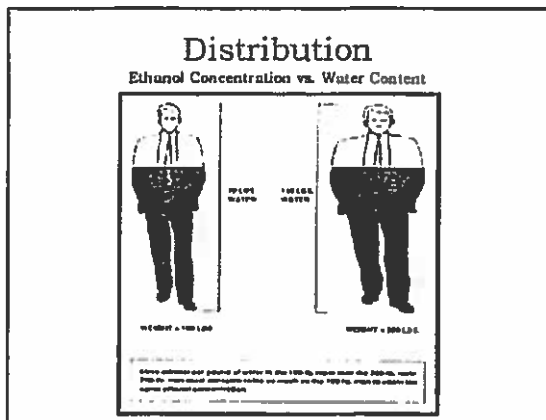
How does ethanol enter the body?

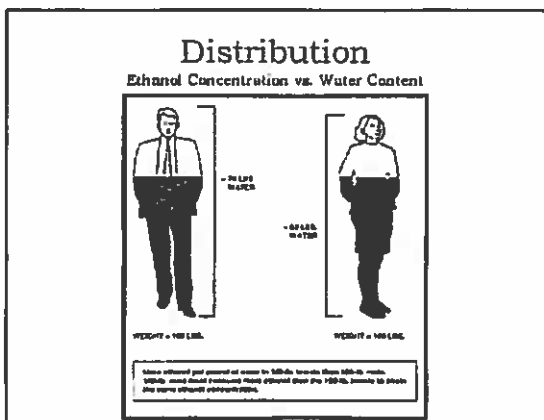


Distribution

How does ethanol move around in the body?







Per Drink Calculation

Widmark Formula
A = PRC

A = Alcohol (amount and concentration)
P = Weight
R = Widmark Number (water content)
C = BAC

Elimination

How does ethanol leave the body?

Metabolism (liver)

Excretion (urine)

Evaporation (breath)

Elimination

Metabolism

Rate at which ethanol is oxidized varies
from one person to another

Elimination rates range from 0.010% to
0.030% per hour

Average rate of elimination is 0.018%
per hour

Retrograde Calculation

Used if chemical test is outside two hours
from the time of driving

Argument does not apply to (A)(1) or (A)(3)

State may retrograde readings to any time
within two hours of driving/APC for per se
statutes

*O'Neill v. Superior Court, (Kunkel/Fitz, RPI), 187 Ariz. 440 (App. 1996);
State v. Claybrook, 193 Ariz. 588 (App. 1998).*

Retrograde Calculation

Practice pointer – be sure to disclose the forensic scientist you will call and his/her opinion re: retrograde.

State v. Roque, 213 Ariz. 193 (2006).

Retrograde Calculation

Information Needed

Drinking and eating history over past hour
Time of test
Test result
Time of driving

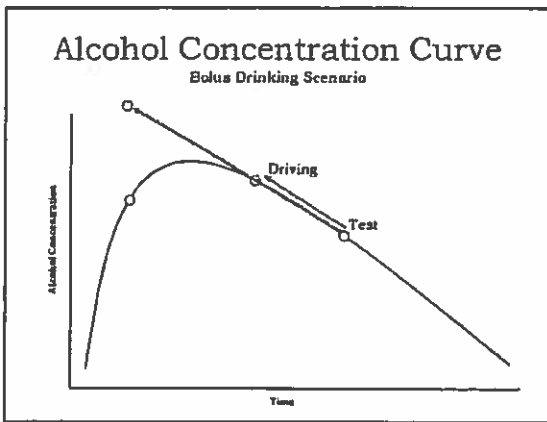
Retrograde Calculation

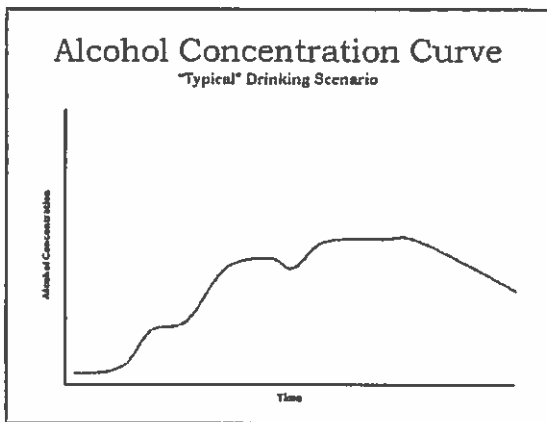
How to Get Your Test Within Two Hours - Retrograde Extrapolation

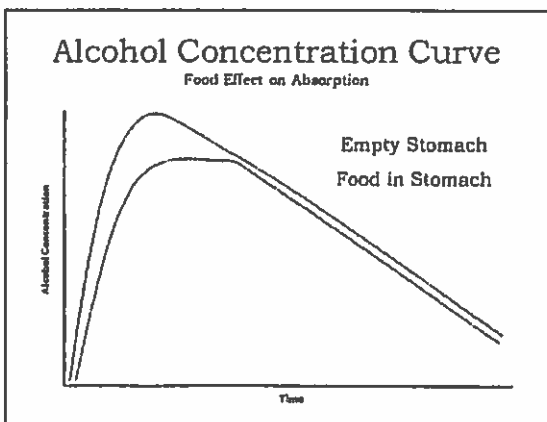
Given certain information, can you calculate the alcohol concentration at a time earlier than the test? (Yes)

What information do you need?

Assuming _____ (fill in the facts from your case) would you please calculate the defendant's alcohol concentration at _____ (time of driving or a point within the 2 hr window)?







Impairment

vs. Intoxication

Impairment - based upon measurable changes in an individual's performance of a specific task, such as operating a motor vehicle

Intoxication - advanced state of impairment in which gross physical signs of the effects of alcohol are apparent

Impairment

COGNITIVE	SENSORY	MOTOR FUNCTION
Judgment impaired	Blurred far vision	Just muscle control
Senses of distance diminished	Visual acuity	Speech
Drivers often become aggressive risk takers, impulsive	Flare resistance	Balance
Lack self-criticism	Flare recovery	Coordination
Attribute to themselves many qualities which they do not possess	Unsteady vision	Walking
Driver's ability to respond to situation becomes impaired	Reaction time to optical and acoustical stimuli	Involuntary jaw syndrome (IJWS)
Flashes blurred	Complex coordination tasks	
Loss of finer grades of sensation, observation and comprehension		
Language of errors and omissions		
Impairment of short-term memory		

Tolerance

Two Types of Tolerance

Metabolic

Functional

Despite tolerance, all people are still impaired to operate a motor vehicle at 0.08 AC

Tolerance

Metabolic

Tolerance that results in a more rapid elimination of alcohol from the body

Innate – genetics and constitution

Exposure dependent – Microsomal Ethanol Oxidizing System (MEOS)

Tolerance

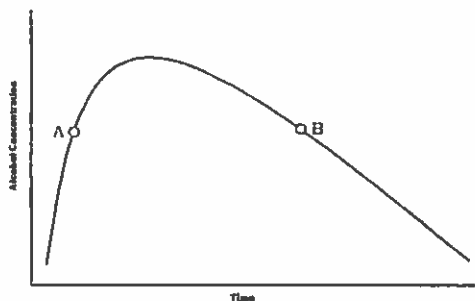
Functional

Tolerance that develops when brain functions adapt to compensate for the disruption in both behavior and bodily functions

Acute – impairment is greater when measured soon after alcohol is consumed than when measured later in the drinking session

Tolerance

Acute



Tolerance

Functional

Chronic – some impairing factors of alcohol are lessened by the central nervous system's response to many drinking sessions

Officer Tools

Driving Cues

Failure to maintain lane position

weaving, straddling lane line, turning to wide, drifting in lane

Speed / Braking problems

stops short at intersection, not maintaining constant speed, driving ten or more miles below speed limit

Vigilance

slow to respond to respond to traffic signal, driving without headlights on, wrong way on street, failure to signal

Judgment

tailgating, unsafe lane change, jerky to fast turn, odd behavior in car

Officer Tools

Driving Cues

Validation - NHTSA performed three field studies that encompassed more than 12,000 stops

Any one cue = 35% likelihood over 0.08%

Any two cues = 50% likelihood over 0.08%

Weaving = 65% likelihood over 0.08%

Driving on wrong side of road =

70% likelihood over 0.08%

Officer Tools

Standardized Field Sobriety Tests (SFSTs)

History

NHTSA sponsored three studies to arrive
at the current battery of three SFSTs

Psychophysical Tests For DWI Arrest, California (1977)

Development and Field Test Of Psychophysical Tests
For DWI Arrest, California (1981)

Field Evaluation Of A Behavioral Battery For DWI,
Maryland, D.C., V.A. N.C. (1983)

Officer Tools

Standardized Field Sobriety Tests (SFSTs)

History

Three additional studies standardized the
tests, finalized grading, and proved
correlation to BAC

Colorado, 1995 (234 acceptable subjects) SCRI
163 arrests out of 175 arrests were correct (93%)

Florida 1997 (256 acceptable Subjects) SCRI
197 arrests out of 206 arrests were correct (95%)

San Diego, 1998 (234 acceptable subjects) Anacapa
210 arrests out of 234 arrests were correct (90%)

Officer Tools

Standardized Field Sobriety Tests (SFSTs)

Horizontal Gaze Nystagmus (HGN)

Involuntary jerking of the eyes

4 of 6 clues = 88% total accuracy (average)
(Your officer is likely better)

6 Clues (3 in each eye)

Lack of smooth pursuit
Nystagmus at maximum deviation
Onset of nystagmus before 45 degrees

Officer Tools

Standardized Field Sobriety Tests (SFSTs)

Walk and Turn

2 of 8 clues = 79% total accuracy (average)

8 Clues

Loses balance during instructions
Starts before the instructions are finished
Stops while walking
Does not touch heel to toe
Steps out of line
Uses arms to balance
Improper turn
Incorrect number of steps

Officer Tools

Standardized Field Sobriety Tests (SFSTs)

One Leg Stand

2 of 4 clues = 83% total accuracy (average)

4 Clues

The suspect sways while balancing
Subject uses his arms to balance
Subject hops while balancing
Subject puts foot down

Blood Alcohol Analysis

Phlebotomy Blood Draw Kits

NIK, Lynn Peavey, and Tri-Tec

Outer box

Inner box

2 vacutainer tubes (grey top)

Preservative - sodium fluoride

Anticoagulant - potassium oxalate

Vacuum dated for freshness

1 non-alcoholic swab

Iodine

Benzalkonium chloride

Butterfly needle

Evidence seals

Blood Alcohol Analysis

Evidence Opening

Notes

One sample open at a time
Seals – evidence tape (not air tight)
Number of tubes
Name
Anything else

Blood Alcohol Analysis

Evidence Opening

Ensure homogeneity of sample
Rock the blood baby
Vortex
Tissue Grinder
Ensures homogeneity of sample

Blood Alcohol Analysis

Pipet Samples

One open at a time
Conical cup
250 Microliters
2 mls of internal standard
Crimp

Blood Alcohol Analysis

Internal Standard Method

AZ DPM Crime Lab: Alcohol Report

Peak	Rt	Area	g/100 mL
Ethanol	1.316	266100	0.2101
n-Propanol	2.479	220407	

AZ DPM Crime Lab: Alcohol Report

Peak	Rt	Area	g/100 mL
Ethanol	1.313	257279	0.2118
n-Propanol	2.480	211521	

Blood Alcohol Analysis

Internal Standard Method

Area Counts

Ethanol - 266100

n-propanol - 220407

Area Counts

Ethanol - 257279

n-propanol - 211521

Ratio

$266100/220407 = 1.20$

Ratio

$257279/211521 = 1.21$

Blood Alcohol Analysis

Report

Arizona Department of Transportation

Alcohol Laboratory

Report

Case No. _____

Sample No. _____

Client _____

Analyst _____

Date _____

Result _____

Remarks _____

Blood Alcohol Analysis

Discovery

"Standard Disclosure"

Scientific Analysis Report

Analyst Notes

Chromatograms for subject's sample

Chain-of-custody

Run summary of Quality Assurance

"Control Packet"

Everything included in Standard Disclosure

Chromatograms for Quality Assurance

Blood Alcohol Analysis

How to Admit Blood Alcohol Results

Sample Collection

Establish: when, where & by whom sample
was collected

Defense may stipulate

Blood Alcohol Analysis

How to Admit Blood Alcohol Results

Chain of Custody

Prove sample tested at the lab is the
defendant's sample

What was sample collected in

How was it labeled

Protocols

Photo

Defense may stipulate to part or all of
chain

Blood Alcohol Analysis

How to Admit Blood Alcohol Results

Chain of Custody

Challenges to the chain of custody go to the weight, not the admissibility of evidence

The defendant must make some showing that the evidence has been tampered with

State v. Morales, 170 Ariz. 360 (App. 1991)

Rule 702

5 Portions of the Rule

- "A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:"

➤ #1 must qualify witness as an expert

➤ Thoroughly qualify your witness

5 Portions of Rule 702 #2

- "a) The expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue"

- Blood testing embraces scientific, technical & other specialized knowledge
- So just relevance

5 Portions of Rule 702 #3

- b) The testimony is based on sufficient facts or data
 - Factual basis for opinion
 - Have expert explain basis for opinion
 - Can the opinion, reasoning or method be properly applied to the facts in issue?
 - What did they do? How did they do it?

5 Portions of Rule 702 #4

- c) The testimony is the product of reliable principles and methods
 - This is similar to *Frye* (accepted in relevant scientific community) – Lay the *Daubert* foundation +
 - Quality assurance
 - Method - Gas Chromatography is reliable & has been tested
 - Studies
 - By manufacturer
 - Lab validation

5 Portions of Rule 702 #5

- d) the expert has reliably applied the principles and methods to the facts of the case.
 - Case specific
 - Did this witness do it correctly
 - Focus is on principles & methodology
 - The accepted technique was properly applied and the results accurately recorded

Daubert !

(Rule 702)

- Qualify witness as an expert
- Chain of custody (prove it was defendant's blood)
- What method was used
- Establish scientific reliability
- What did he/she do?
- Emphasize quality assurance/reliability

Blood Alcohol Analysis

How to Admit Blood Alcohol Results

Deason/Daubert

Establish general acceptance of underlying science (i.e. Infrared Spectrophotometry, Gas Chromatography or Mass Spectrometry).

Is the method used accepted in the relevant scientific community as a valid method for breath/blood/urine testing?

Blood Alcohol Analysis

How to Admit Blood Alcohol Results

Deason/Daubert

Based on a review of the procedure used in analyzing the sample, the test results, and records:

- The accepted technique was properly used
- The readings are an accurate measurement and recording of the defendant's alcohol concentration (or the presence of drugs)
- The test results would be accepted in the relevant scientific community as valid test results (legally not required but judge may)

Blood Alcohol Analysis

Headspace Gas Chromatography

Measures alcohol content in the air above the blood

Standard in the scientific community for blood alcohol analysis



Blood Alcohol Analysis

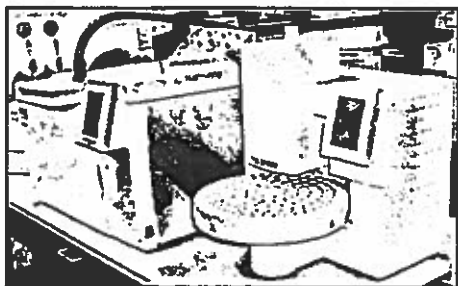
Henry's Law

In a closed system, the concentration of a volatile substance above a fluid is proportional to the concentration of that substance in the fluid at equilibrium

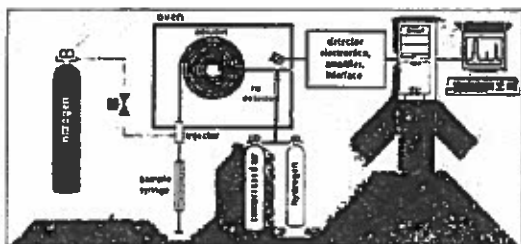


Blood Alcohol Analysis

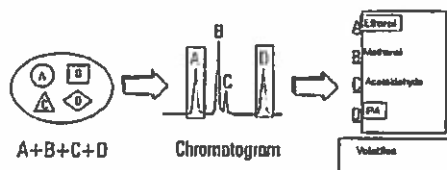
PerkinElmer Clarus 500 w/ Turbomatrix HS110



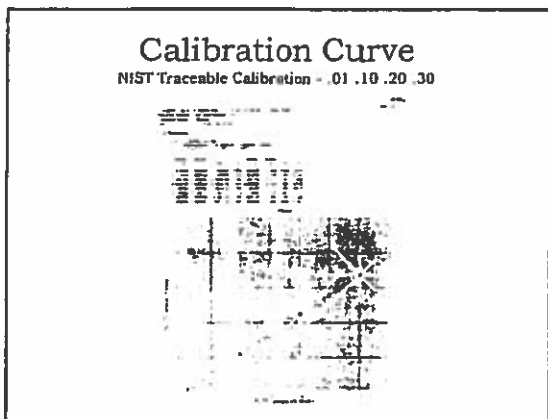
Blood Alcohol Analysis Chromatography

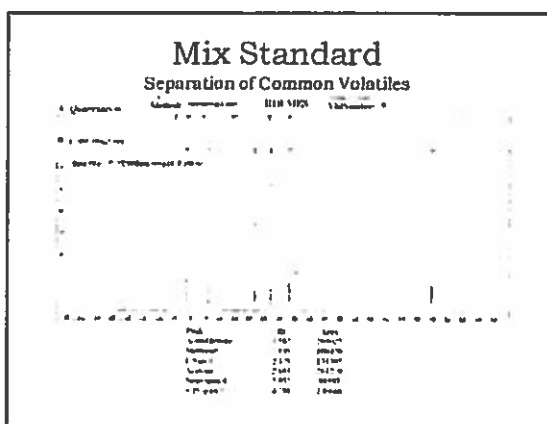


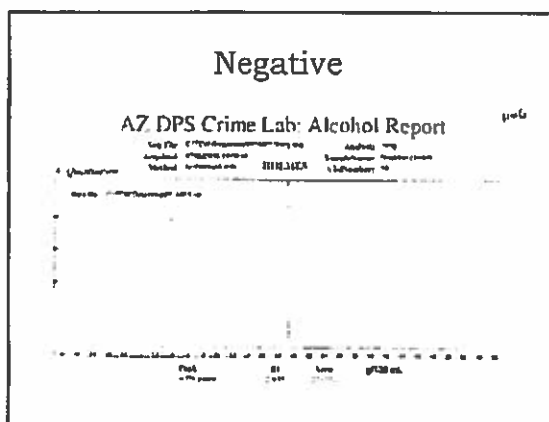
Blood Alcohol Analysis Chromatography

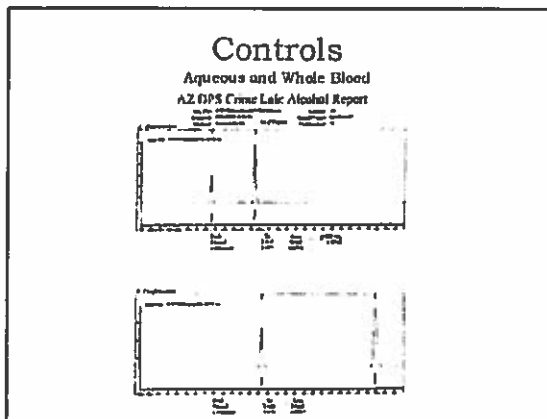


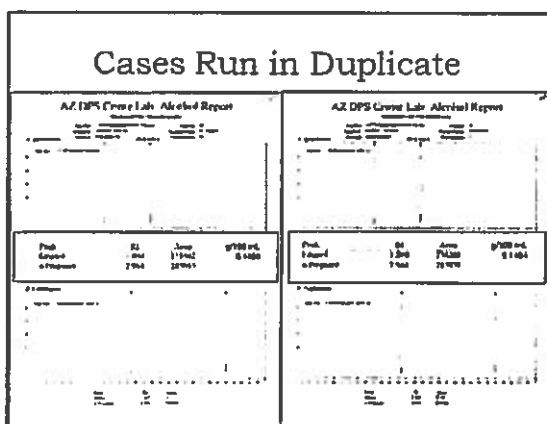
Blood Alcohol Analysis Quality Assurance

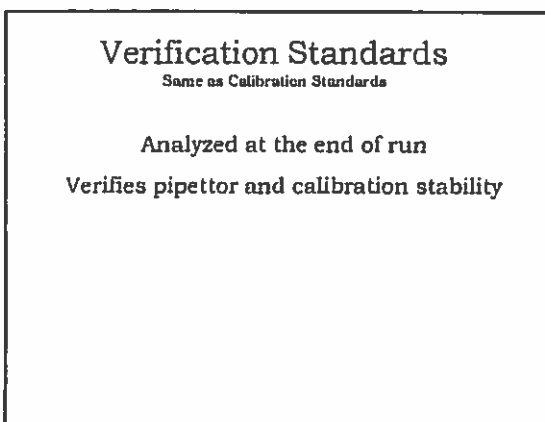












Blood Alcohol Analysis

Batch

Blood Alcohol General Sequence Guide					
Val #	Val Type	Val #	Val Type	Val #	Val Type
1	0 01 Calibration	24	Comp 14	47	Comp 27a
2	0 01 Calibration	25	Comp 15	48	Comp 27b
3	0 01 Calibration	26	Comp 16	49	Comp 27c
4	0 01 Calibration	27	Comp 17	50	Comp 27d
5	0 01 Calibration	28	Comp 18	51	Comp 27e
6	0 01 Calibration	29	Comp 19	52	Comp 27f
7	0 01 Calibration	30	Comp 20	53	Comp 27g
8	0 01 Calibration	31	Comp 21	54	Comp 27h
9	0 01 Calibration	32	Comp 22	55	Comp 27i
10	0 01 Calibration	33	Comp 23	56	Comp 27j
11	0 01 Calibration	34	Comp 24	57	Comp 27k
12	0 01 Calibration	35	Comp 25	58	Comp 27l
13	0 01 Calibration	36	Comp 26	59	Comp 27m
14	0 01 Calibration	37	Comp 27	60	Comp 27n
15	0 01 Calibration	38	Comp 28	61	Comp 27o
16	0 01 Calibration	39	Comp 29	62	Comp 27p
17	0 01 Calibration	40	Comp 30	63	Comp 27q
18	0 01 Calibration	41	Comp 31	64	Comp 27r
19	0 01 Calibration	42	Comp 32	65	Comp 27s
20	0 01 Calibration	43	Comp 33	66	Comp 27t
21	0 01 Calibration	44	Comp 34	67	Comp 27u
22	0 01 Calibration	45	Comp 35	68	Comp 27v
23	0 01 Calibration	46	Comp 36	69	Comp 27w
24	0 01 Calibration	47	Comp 37	70	Comp 27x
25	0 01 Calibration	48	Comp 38	71	Comp 27y
26	0 01 Calibration	49	Comp 39	72	Comp 27z
27	0 01 Calibration	50	Comp 40	73	Comp 27a
28	0 01 Calibration	51	Comp 41	74	Comp 27b
29	0 01 Calibration	52	Comp 42	75	Comp 27c
30	0 01 Calibration	53	Comp 43	76	Comp 27d
31	0 01 Calibration	54	Comp 44	77	Comp 27e
32	0 01 Calibration	55	Comp 45	78	Comp 27f
33	0 01 Calibration	56	Comp 46	79	Comp 27g
34	0 01 Calibration	57	Comp 47	80	Comp 27h
35	0 01 Calibration	58	Comp 48	81	Comp 27i
36	0 01 Calibration	59	Comp 49	82	Comp 27j
37	0 01 Calibration	60	Comp 50	83	Comp 27k
38	0 01 Calibration	61	Comp 51	84	Comp 27l
39	0 01 Calibration	62	Comp 52	85	Comp 27m
40	0 01 Calibration	63	Comp 53	86	Comp 27n
41	0 01 Calibration	64	Comp 54	87	Comp 27o
42	0 01 Calibration	65	Comp 55	88	Comp 27p
43	0 01 Calibration	66	Comp 56	89	Comp 27q
44	0 01 Calibration	67	Comp 57	90	Comp 27r
45	0 01 Calibration	68	Comp 58	91	Comp 27s
46	0 01 Calibration	69	Comp 59	92	Comp 27t
47	0 01 Calibration	70	Comp 60	93	Comp 27u
48	0 01 Calibration	71	Comp 61	94	Comp 27v
49	0 01 Calibration	72	Comp 62	95	Comp 27w
50	0 01 Calibration	73	Comp 63	96	Comp 27x
51	0 01 Calibration	74	Comp 64	97	Comp 27y
52	0 01 Calibration	75	Comp 65	98	Comp 27z
53	0 01 Calibration	76	Comp 66	99	Comp 27a
54	0 01 Calibration	77	Comp 67	100	Comp 27b
55	0 01 Calibration	78	Comp 68	101	Comp 27c
56	0 01 Calibration	79	Comp 69	102	Comp 27d
57	0 01 Calibration	80	Comp 70	103	Comp 27e
58	0 01 Calibration	81	Comp 71	104	Comp 27f
59	0 01 Calibration	82	Comp 72	105	Comp 27g
60	0 01 Calibration	83	Comp 73	106	Comp 27h
61	0 01 Calibration	84	Comp 74	107	Comp 27i
62	0 01 Calibration	85	Comp 75	108	Comp 27j
63	0 01 Calibration	86	Comp 76	109	Comp 27k
64	0 01 Calibration	87	Comp 77	110	Comp 27l
65	0 01 Calibration	88	Comp 78	111	Comp 27m
66	0 01 Calibration	89	Comp 79	112	Comp 27n
67	0 01 Calibration	90	Comp 80	113	Comp 27o
68	0 01 Calibration	91	Comp 81	114	Comp 27p
69	0 01 Calibration	92	Comp 82	115	Comp 27q
70	0 01 Calibration	93	Comp 83	116	Comp 27r
71	0 01 Calibration	94	Comp 84	117	Comp 27s
72	0 01 Calibration	95	Comp 85	118	Comp 27t
73	0 01 Calibration	96	Comp 86	119	Comp 27u
74	0 01 Calibration	97	Comp 87	120	Comp 27v
75	0 01 Calibration	98	Comp 88	121	Comp 27w
76	0 01 Calibration	99	Comp 89	122	Comp 27x
77	0 01 Calibration	100	Comp 90	123	Comp 27y
78	0 01 Calibration	101	Comp 91	124	Comp 27z
79	0 01 Calibration	102	Comp 92	125	Comp 27a
80	0 01 Calibration	103	Comp 93	126	Comp 27b
81	0 01 Calibration	104	Comp 94	127	Comp 27c
82	0 01 Calibration	105	Comp 95	128	Comp 27d
83	0 01 Calibration	106	Comp 96	129	Comp 27e
84	0 01 Calibration	107	Comp 97	130	Comp 27f
85	0 01 Calibration	108	Comp 98	131	Comp 27g
86	0 01 Calibration	109	Comp 99	132	Comp 27h
87	0 01 Calibration	110	Comp 100	133	Comp 27i
88	0 01 Calibration	111	Comp 101	134	Comp 27j
89	0 01 Calibration	112	Comp 102	135	Comp 27k
90	0 01 Calibration	113	Comp 103	136	Comp 27l
91	0 01 Calibration	114	Comp 104	137	Comp 27m
92	0 01 Calibration	115	Comp 105	138	Comp 27n
93	0 01 Calibration	116	Comp 106	139	Comp 27o
94	0 01 Calibration	117	Comp 107	140	Comp 27p
95	0 01 Calibration	118	Comp 108	141	Comp 27q
96	0 01 Calibration	119	Comp 109	142	Comp 27r
97	0 01 Calibration	120	Comp 110	143	Comp 27s
98	0 01 Calibration	121	Comp 111	144	Comp 27t
99	0 01 Calibration	122	Comp 112	145	Comp 27u
100	0 01 Calibration	123	Comp 113	146	Comp 27v
101	0 01 Calibration	124	Comp 114	147	Comp 27w
102	0 01 Calibration	125	Comp 115	148	Comp 27x
103	0 01 Calibration	126	Comp 116	149	Comp 27y
104	0 01 Calibration	127	Comp 117	150	Comp 27z
105	0 01 Calibration	128	Comp 118	151	Comp 27a
106	0 01 Calibration	129	Comp 119	152	Comp 27b
107	0 01 Calibration	130	Comp 120	153	Comp 27c
108	0 01 Calibration	131	Comp 121	154	Comp 27d
109	0 01 Calibration	132	Comp 122	155	Comp 27e
110	0 01 Calibration	133	Comp 123	156	Comp 27f
111	0 01 Calibration	134	Comp 124	157	Comp 27g
112	0 01 Calibration	135	Comp 125	158	Comp 27h
113	0 01 Calibration	136	Comp 126	159	Comp 27i
114	0 01 Calibration	137	Comp 127	160	Comp 27j
115	0 01 Calibration	138	Comp 128	161	Comp 27k
116	0 01 Calibration	139	Comp 129	162	Comp 27l
117	0 01 Calibration	140	Comp 130	163	Comp 27m
118	0 01 Calibration	141	Comp 131	164	Comp 27n
119	0 01 Calibration	142	Comp 132	165	Comp 27o
120	0 01 Calibration	143	Comp 133	166	Comp 27p
121	0 01 Calibration	144	Comp 134	167	Comp 27q
122	0 01 Calibration	145	Comp 135	168	Comp 27r
123	0 01 Calibration	146	Comp 136	169	Comp 27s
124	0 01 Calibration	147	Comp 137	170	Comp 27t
125	0 01 Calibration	148	Comp 138	171	Comp 27u
126	0 01 Calibration	149	Comp 139	172	Comp 27v
127	0 01 Calibration	150	Comp 140	173	Comp 27w
128	0 01 Calibration	151	Comp 141	174	Comp 27x
129	0 01 Calibration	152	Comp 142	175	Comp 27y
130	0 01 Calibration	153	Comp 143	176	Comp 27z
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132	0 01 Calibration	155	Comp 145	178	Comp 27b
133	0 01 Calibration	156	Comp 146	179	Comp 27c
134	0 01 Calibration	157	Comp 147	180	Comp 27d
135	0 01 Calibration	158	Comp 148	181	Comp 27e
136	0 01 Calibration	159	Comp 149	182	Comp 27f
137	0 01 Calibration	160	Comp 150	183	Comp 27g
138	0 01 Calibration	161	Comp 151	184	Comp 27h
139	0 01 Calibration	162	Comp 152	185	Comp 27i
140	0 01 Calibration	163	Comp 153	186	Comp 27j
141	0 01 Calibration	164	Comp 154	187	Comp 27k
142	0 01 Calibration	165	Comp 155	188	Comp 27l
143	0 01 Calibration	166	Comp 156	189	Comp 27m
144	0 01 Calibration	167	Comp 157	190	Comp 27n
145	0 01 Calibration	168	Comp 158	191	Comp 27o
146	0 01 Calibration	169	Comp 159	192	Comp 27p
147	0 01 Calibration	170	Comp 160	193	Comp 27q
148	0 01 Calibration	171	Comp 161	194	Comp 27r
149	0 01 Calibration	172	Comp 162	195	Comp 27s
150	0 01 Calibration	173	Comp 163	196	Comp 27t
151	0 01 Calibration	174	Comp 164	197	Comp 27u
152	0 01 Calibration	175	Comp 165	198	Comp 27v
153	0 01 Calibration	176	Comp 166	199	Comp 27w
154	0 01 Calibration	177	Comp 167	200	Comp 27x
155	0 01 Calibration	178	Comp 168	201	Comp 27y
156	0 01 Calibration	179	Comp 169	202	Comp 27z
157	0 01 Calibration	180	Comp 170	203	Comp 27a
158	0 01 Calibration	181	Comp 171	204	Comp 27b
159	0 01 Calibration	182	Comp 172	205	Comp 27c
160	0 01 Calibration	183	Comp 173	206	Comp 27d
161	0 01 Calibration	184	Comp 174	207	Comp 27e
162	0 01 Calibration	185	Comp 175	208	Comp 27f
163	0 01 Calibration	186	Comp 176	209	Comp 27g
164	0 01 Calibration	187	Comp 177	210	Comp 27h
165	0 01 Calibration	188	Comp 178	211	Comp 27i
166	0 01 Calibration	189	Comp 179	212	Comp 27j
167	0 01 Calibration	190	Comp 180	213	Comp 27k
168	0 01 Calibration	191	Comp 181	214	Comp 27l
169	0 01 Calibration	192	Comp 182	215	Comp 27m
170	0 01 Calibration	193	Comp 183	216	Comp 27n
171	0 01 Calibration	194	Comp 184	217	Comp 27o
172	0 01 Calibration	195	Comp 185	218	Comp 27p
173	0 01 Calibration	196	Comp 186	219	Comp 27q
174	0 01 Calibration	197	Comp 187	220	Comp 27r
175	0 01 Calibration	198	Comp 188	221	Comp 27s
176	0 01 Calibration	199	Comp 189	222	Comp 27t
177	0 01 Calibration	200	Comp 190	223	Comp 27u
178	0 01 Calibration	201	Comp 191	224	Comp 27v
179	0 01 Calibration	202	Comp 192	225	Comp 27w
180	0 01 Calibration	203	Comp 193	226	Comp 27x
181	0 01 Calibration	204	Comp 194	227	Comp 27y
182	0 01 Calibration	205	Comp 195	228	Comp 27z
183	0 01 Calibration	206	Comp 196	229	Comp 27a
184	0 01 Calibration	207	Comp 197	230	Comp 27b
185	0 01 Calibration	208	Comp 198	231	Comp 27c
186	0 01 Calibration	209	Comp 199	232	Comp 27d
187	0 01 Calibration	210	Comp 200	233	Comp 27e
188	0 01 Calibration	211	Comp 201	234	Comp 27f
189	0 01 Calibration	212	Comp 202	235	Comp 27g
190	0 01 Calibration	213	Comp 203	236	Comp 27h
191	0 01 Calibration	214	Comp 204	237	Comp 27i
192	0 01 Calibration	215	Comp 205	238	Comp 27j
193	0 01 Calibration	216	Comp 206	239	Comp 27k
194	0 01 Calibration	217	Comp 207	240	Comp 27l
195	0 01 Calibration	218	Comp 208	241	Comp 27m
196	0 01 Calibration	219	Comp 209	242	Comp 27n
197	0 01 Calibration	220	Comp 210	243	Comp 27o
198	0 01 Calibration	221	Comp 211	244	Comp 27p
199	0 01 Calibration	222	Comp 212	245	Comp 27q
200	0 01 Calibration	223	Comp 213	246	Comp 27r
201	0 01 Calibration	224	Comp 214	247	Comp 27s
202	0 01 Calibration	225	Comp 215	248	Comp 27t
203	0 01 Calibration	226	Comp 216	249	Comp 27u
204	0 01 Calibration	227	Comp 217	250	Comp 27v
205	0 01 Calibration	228	Comp 218	251	Comp 27w
206	0 01 Calibration	229	Comp 219	252	Comp 27x
207	0 01 Calibration	230	Comp 220	253	Comp 27y
208	0 01 Calibration	231	Comp 221	254	Comp 27z

Battle of the Experts

Disagreements between expert witnesses go to weight, not the admissibility. *State v. Velasco*, (Alday, RPI), 165 Ariz. 480, 486, (1990).

Where there is a lack of unanimity in scientific community on accuracy of a breath test, "the scientific disagreement affects only the weight and not the admissibility of evidence." *State v. Olivas*, 77 Ariz. 118 (1954).

Your Criminalist and You

Can do drink calculations

"One beer" How big would that be?

Retrogrades

Effect of alcohol on humans

Explain issues with the Intox

Rebut defense expert's testimony

Questions?

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